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FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

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SCHEDULED DISEASE IN 1915.

Last week the Board of Agriculture completed the returns of contagious disease for 1915, and, on the whole, the results of the year's work are satisfactory.

Foot-and-mouth disease is a rather disappointing item. For the first nine months of 1915 we were free from it; but there has since been a distinctly serious visitation, of which it is not yet certain that we have seen the end. The outbreak was quickly brought under control; and, as many previous outbreaks have done, it illustrated at the same time both our ability to deal with such visitations whenever they occur, and our powerlessness to prevent their occurrence.

Anthrax has fallen substantially this year, and is now lower than it ever has been since the present Anthrax Order came in. Sheep scab, on the other hand, shows a slight increase upon both 1914 and 1913, contrasting with its previous record of steady decline under the present regulations. Possibly war conditions account for the rise, which is too slight to be disturbing.

We seem now to be making good progress against parasitic mange. The Order was in force practically for the first seven months of 1914 and the last nine months of 1915; and the outbreaks in the two periods numbered respectively 1530 and 911. Various factors render it difficult to judge these figures; but they seem satisfactory, especially as the returns have declined in the later part of 1915.

Swine fever has decreased slightly from 1914, but still remains higher than it was for a good many years before that. Our methods of dealing with this disease are likely soon to be radically altered; and no one will deny the necessity for it. All the measures we have taken against swine fever so far have been anything but satisfactory.

We are making splendid progress against glanders. There were exactly 50 outbreaks in 1915—rather less than one per week—against 97 in 1914. This is a great advance; but it becomes greater still when we remember that in 1909—only six years ago—we had 533 outbreaks. This progress has only been possible through the rational use of mallein as a Government test which the present Glanders Order introduced: and this procedure will enable us speedily to eliminate glanders from civilian horses, and to deal with any that afterwards comes to us from the army as a result of the war.

ACTINOBACILLOSIS.

In our issue of Nov. 20 we reprinted from a medical paper a note on the investigation in the pathological laboratory of the Local Government Board on 50 imported tongues—from Argentina, North America and Siberia—and 44 fresh specimens from animals in this country: and a "Preliminary report on the Pathology of Bovine Actinomycosis" has been published. The note passed without comment in this country; but it brought us from Canada a copy of the Bulletin on the subject, issued in March, 1904, by the Animals branch of their Department of Agriculture, then under the direction of Dr. J. G. Rutherford. Apparently little has been added to our knowledge of the disease since that time, and we have reprinted the greater portion of the bulletin and some of the illustrations.

One would have thought that with an effective veterinary department at the Board of Agriculture, such an investigation—if necessary—would have fallen to be made by their officers in the first place.

The note that we reprinted states that "the biological properties of the organisms have yet to be studied," and that "transmission from animals to man has not yet been established."

TUBERCULOSIS OF THE MYOCARDIUM IN A CALF.

Balson records the following post-mortem observation upon a calf two months old, which was affected with generalised tuberculosis (*Rec. de Méd. Vét.*) Ordinary tuberculous lesions were found in the bronchial, mediastinal, prescapular, and hepatic lymphatic glands, and in the parenchyma of the spleen. The parenchyma of the lungs, liver, and kidneys showed no lesions. The exterior of the heart showed, at the point and in the thickness of the wall of the left ventricle, an elevated whitish spot resembling a degenerated parasitic lesion. Section of the myocardium brought to light a second lesion analogous to the first.

These were really homogenous tubercles, sarcomatous in aspect, and intimately connected with the muscular fibres, among which yellowish tracts of caseo-calcareous degeneration were irregularly disseminated. Microscopic examination revealed the presence of acid-fast bacilli.

A guinea-pig was inoculated with a triturition from these lesions. Three weeks later the animal showed a characteristic ulceration at the point of injection, involving the corresponding inguinal gland. A month later the guinea-pig was destroyed; tubercle bacilli were demonstrated in the pus of the ulcer, and classic tuberculous lesions

were found in the mesenteric glands and in the liver. The other parenchymatous organs showed no lesions. The case was therefore one of a tuberculous lesion of the myocardium, which resembled a parasitic lesion.—(*La Clinica Veterinaria*).

SUDDEN DEATH AFTER AMPUTATION OF THE UDDER.

Johann, of Bütow, has recorded this case with a view to discovering whether similar ones have been observed.

The subject was a young cow, one half of whose udder Johann amputated. After the operation the cow stood up, and appeared vigorous. Johann had her placed in a stall, and went into the house to clean his instrument. After doing this he returned to the stall for a final look at the animal before leaving the place, and found her dead.

The ligatures had held, and no bleeding had taken place. The only factor which occurred to Johann as the cause of death was an aspiration of air through a gaping vein. No post-mortem examination was made.—(*Berliner Tier. Woch.*)

COCCIDIOSIS IN CATTLE AND CARABAOS.

C. H. Schultz has published this article (*Journal Infec. Dis.*, 1915, July, Vol. 17, No. 1, pp. 95-108.

In carrying out rinderpest investigations the author encountered a number of "irregular cases" which eventually proved to be cases of coccidiosis, or, as the author prefers to call it, coccidian gastro-enteritis.

Great emphasis is laid on the difficulty of differentiating coccidiosis from rinderpest, and in the paper the information regarding the two diseases is somewhat curiously intermixed.

The author states that in one case of coccidiosis which showed lesions at the post-mortem identical with those of rinderpest, "young forms of the schizogonous type could be found in countless numbers in scrapings from the ulcerated abomasum" and the whole of the intestinal tract.

He also states that by careful laking and centrifugation of blood taken from an animal recovering from a severe attack of coccidian dysentery spores can be obtained in appreciable numbers. It is said that coccidia can be found more easily in the urine than in the fæces, and that in the urine they appear under the immersion lens as "dense small coccoid bodies," the larger forms "being apparently held back by the kidneys."

"When spores are first liberated they are quite large, about one-half the size of an erythrocyte. As the spores become more developed, they show a denser capsule and become smaller."

The author states that from his "own observations in rinderpest experiments it would appear, in view of the peculiar methods by which coccidia can be divided in most minute organisms (Zublein, 1908), that one part of their life-cycle is passed in the blood-vascular system, and that their rapid multiplication in most minute forms produces the hæmolytic form of the disease. This is superseded, if the host lives, by the diarrheal form, the latter being necessary to re-infect other hosts and to transfer the contagion from one place to another."

. . . . . .

"We cannot deny that acute coccidiosis has invariably resulted from rinderpest inoculations. Our last cases (3694 and 3714) died from coccidian gastro-enteritis of the most severe type after receiving a subcutaneous injection of 5 c.c. of rinderpest blood. Since we have been able to recognise coccidiosis, we have never found a case of rinderpest without the presence of these organisms in great numbers." . . . . . .

"Of four guinea-pigs that were inoculated with blood from spore-bearing cattle, two died (about seven weeks later) from coccidian dysentery, one died from pneumonia, and one is still alive and doing well." . . . . . .

"A good illustration of nature's methods of producing immunity against protozoa is found in our Southern States, where cattle, inoculated by ticks with piro-plasmosis for generations, have acquired a very high resistance."—(*Trop. Vet. Bulletin*).

W. R. C.

ACTINOBACILLOSIS.

By CHAS. H. HIGGINS, B.S., D.V.S.

(Bulletin of the Animals Branch, Dept. of Agriculture, Dominion of Canada). Abridged.

The possibility of this disease existing in Canada was first mentioned by the Veterinary Director General of the Department of Agriculture, Dr. J. G. Rutherford, in his annual report of 1902. The confirmation of this suspicion was made by the writer in an official report dated June 23, 1903, and since that time three other identified cases have been studied and have also furnished the data upon which this Bulletin is based.

The non-identification of this disease in the past has been due to the fact that little or no original work has been conducted in Canada on the infectious diseases of animals, and when such work has been accomplished the greatest difficulties have been encountered.

This disease bears a similarity to the disease known as "Actinomycosis" or "Lumpy Jaw"; in fact a study of its anatomical manifestations and pathological lesions would lead the uninitiated to believe they were dealing with that classic affection. Until 1900-01, the two diseases were considered identical, no effort had been made to differentiate between them until it was shown by Lignières and Spitz that two distinct diseases were being treated under the one name, "Actinomycosis." Their work was exhaustive and indicated that beside the streptothrix causing the classic Actinomycosis, a bacillus, having none of the characteristics of a dichotomous streptothrix was responsible for lesions exhibiting the same general character as are found in Actinomycosis, with the exception of their micro-chemical reactions. From its bacillary causative agent they named it "Actinobacillosis" (ray-forming bacillus).

Nocard, in 1902, identified this affection in France, and showed also that its distribution was general in that country.

The disease studied by us is identical with that studied by Lignières and Spitz in the Argentine Republic, and M. Nocard in France, with the exception that the bacillus isolated from our cases has not in any instance shown the degree of virulence credited to that isolated by the investigators mentioned, hence we may safely assume that in the cases studied, we have been dealing with an attenuated form of the disease.

The history of the four cases identified by us is very brief and will be given in as full a manner as the data accompanying the material forwarded allows.

Case I. An aged grade cow. Suffered considerably in fall of 1901 and spring of 1902. After being allowed to run to pasture for a time and delivered of her calf she seemed to make good recovery. This year (1903) the symptoms returned in a more aggravated form and the animal was destroyed. The affected portion, consisting of the pharynx, larynx and the upper part of the trachea, including the œsophagus and tumour mass, was forwarded to the laboratory.

The material on arrival was looked upon as a tumour of non-infectious character and was immediately placed in a solution of formaldehyde until the pressure of routine work would allow its examination, which was a few days later. On section the characteristic semi-fluid glue-like pus was revealed which is almost diagnostic. It was only at this time that the exact nature of the affection was suspected and this too late to obtain positive results from animal inoculation on account of the time the material had remained in the preserving fluid. Microscopic preparations of the pus revealed the peculiar clubs, and no portion of the smear preparation retained the colouring matter when treated by the method of Gram. Sections of the tumour cut in paraffin exhibited the same microchemical characteristics.

Case II. A pure bred Shorthorn bull. Examined by the local veterinarian in May, he had what was diagnosed as a small abscess in the left parotid gland. Potassium iodide was prescribed and continued for a long period, nevertheless, the abscess increased in size, the animal continued losing flesh, and breathed with some difficulty, due to the pressure on the larynx of the tumour mass. Later another abscess appeared on the hip near the tail. Owing to the condition of the animal and the progress the disease was making he was destroyed.

The material forwarded to the laboratory in this instance consisted of pus, taken at the time of opening the abscess in the region of the parotid gland. Laboratorary animals (guinea-pigs and rabbits) were immediately inoculated. The first animal to succumb to the effects of the inoculation was a guinea-pig, death occurring on the nineteenth day after intra-peritoneal injection of the pus. At the autopsy this animal exhibited the characteristic lesions of the disease, from which the bacillus was obtained in pure cultures.

Case III. The veterinarian was called to see the animal and owing to the extremely emaciated condition of the subject she was destroyed. It was noted that the tongue was not normal, in consequence of which it was removed and forwarded to the laboratory.

Arriving in fresh condition animal inoculations were made subcutaneously, the first succumbing to the effects of the disease at the end of twenty-six days. The lesions at the autopsy were characteristic of the disease, and the bacillus was obtained from them in pure culture.

Case IV. A growth appeared on the jaw of an animal which was being fattened for beef. This growth was supposed to have resulted from the kick of a horse. A portion of the mass was forwarded to the laboratory for examination.

On microscopical examination the lesions of Actinobacillosis were found, there being no filaments, and no portion of the material retained the colouring matter when treated by the method of Gram.

Lesions. The gross lesions seen in an infected animal are very similar to those of Actinomycosis, consisting principally of a fibrous tissue hyperplasia. In many instances the lesions can only be differentiated from from those of Actinomycosis by their reaction to the various colouring matters used in preparing the material for microscopic examination, particularly to the method of Gram, decolourizing when treated with alcohol. The pus is characteristic, of a semi-solid consistency, glutinous, almost transparent and containing whitish granules which are scarcely visible to the naked eye. These granules when examined under the microscope exhibit "bizarre" forms, which under high magnification show the peculiar bulb-like processes radiating from the mass. Owing to the glutinous nature of the pus it is with difficulty drawn into the ordinary laboratory pipettes, which must be of large calibre. If successfully drawn into them, greater difficulty is experienced in removing it in the process of making cover-slip preparations, cultures or animal inoculations.

Cultural Characteristics. Cultures are obtained direct from the pus with some difficulty, it being first necessary to crush the granular masses. It has been our practice to crush these particles against the side of the test-tube, using a heavy platinum wire for the purpose.

Morphology. The bacillus causing Actinobacillosis resembles in a marked degree the bacillus of Fowl Cholera. It is aerobic, facultative anaerobic, non-motile and in sizes varies, usually being 1·0–1·8 μ long and 0·4–0·6 μ broad. A distinct polar arrangement of the protoplasm is noted in the hanging drop preparation. It stains with the ordinary aniline dyes, particularly those which are acidulated; but does not retain the colouring matter when treated by the method of Gram.

Cultures in beef broth show a slight colouring of the medium in twenty-four hours at 37° C. This cloudiness increases and after some days a slight sediment is noted. No scum has appeared on the surface of the medium. The addition of glycerine, up to five per cent, does not influence the growth.

Only occasionally has it been possible to obtain any growth in gelatin, and even this has been very slight, appearing as very fine points, visible only on magnification. These points may appear deep in the medium, along the line of stab or near the surface. No liquifaction of this medium has been observed.

Upon agar, small translucent colonies of one millimetre in diameter are noted at the end of twenty-four hours. The edges of these colonies are granular. In stab cultures growth is observed in the depth of the medium as well as on the surface. Colonies deep in the medium along the line of stab are finely granular and do not extend into the surrounding medium.

No formation of gas has been noted in saccharose, glucose or lactose broth. There is a clouding of these media.

Milk to which litmus and lactose have been added exhibits no change in reaction, nor is there a coagulation of the medium. This medium furnishes conditions favourable to the development of this organism.

In liquid serum a flocculent growth is observed in from twenty-four to forty-eight hours, which falls to the bottom of the tube. No general turbidity of this medium is observed.

Upon alkaline potato a slight growth is noted after four days, appearing as small white colonies on the medium. Potatoes which are acid present no growth even after prolonged incubation.

It was with egg media that the greater portion of our investigations with this disease were carried out, and it was the only medium used in the isolation of the bacillus. In the process of isolating the germ from the affected tissue of an experimental animal, the precautions noted by Theodore Smith for the isolation of the tubercle bacillus were observed. A portion of the tissue taken under such precautions are placed in the tube, partially crushed with a heavy platinum wire and smeared over the surface of the medium. A growth may appear in three days, but was in some instances not observed previous to eighteen days' incubation a 37° C. The first colonies appear as very small white dots raised from the surrounding medium, and in growing, form a mass which has the appearance of half a sphere, never

attaining a diameter greater than two millimeters after prolonged incubation. If these first colonies are touched with the platinum wire, they are found to be rather hard and firmly adherent to the underlying medium, but if a smear preparation is made, the characteristic bacilli are found. If streaks on the medium are made from these first colonies, either in the same tube or transfers, observation after twenty-four hours reveals many small colonies, none exceeding one millimetre in diameter. After prolonged incubation the colonies grow very little larger, but become more numerous, gradually filling the intervening space, and finally form a white streak on the medium.

A trace of indol is present in old broth cultures.

Serum of experimental animals affected with Actinobacillosis causes a clumping of the bacilli in the hanging drop preparation, while that of other animals not infected causes no agglutination reaction.

The bacillus is destroyed in ten minutes at 62° C. Growths are obtained only at incubator temperature (37° C.), but may occasionally be obtained in a very slight degree at room temperature (20° C.). Tissue kept frozen for seven days, during which time the temperature ranged from − 0° F. to − 20° F., proved fatal to guinea-pigs on subcutaneous inoculation, in 25, 28 and 45 days respectively.

ANIMAL INOCULATIONS.

Guinea-pigs. Guinea-pigs inoculated intra-peritoneally with pure cultures of pus die in from nineteen to thirty-one days of a generalised actinobacillosis. We have been unable to produce death in a shorter period with a general peritonitis, which fact indicates, as already stated, that we are dealing with an attenuated virus.

The lesions presented at the autopsy are characteristic and very interesting, being entirely different from those observed, the result of other infective agents. Small pearly-white nodules appear just beneath the peritoneal and pleural membranes, varying from 1·0–to 5·0 mm. in diameter. The liver presents lesions throughout its substance, its surface being mottled. The spleen shows, usually, a varying number of nodules. The great mesenteric fold of the omentum has in every instance been the seat of extensive lesions, and in some cases has a thickness of one and one-half centimetres and a length of eight centimetres. The kidneys present nodules beneath their serous covering, but none have been observed in the substance of the organ. The diaphragm may contain numerous nodules beneath its serous surfaces. The stomach and intestines usually present nodules on their serous surfaces, varying from 1·0 m.m. to 0·5 cm. in diameter. Ulcers are usually present on the mucous surface of the stomach varying in size from 3·0 to 5·0 mm. in diameter. Ulcers were also noted in the intestine, particularly in the cæcum and large intestine. The lungs present greater or less involvement of their structure; in some instances there being a few superficial nodules, while in others the lesions are general throughout the tissue of these organs. Serous fluid has been present in both the thoracic and abdominal cavities, but it is not constantly found in either. Nodules have been observed on the surface of the heart and in the pericardial membrane. An excessive amount of fluid may or may not be present in the pericardial sac. No lesions of the endocardium have been observed. At the point where the needle enters the peritoneal cavity there is always an extensive nodular manifestation in the abdominal wall beneath the peritoneum. The various lymph glands are usually enlarged, and present lesions.

Subcutaneous inoculation is usually followed by the same general lesions above mentioned. There is usually an abscess formed at the point of inoculation, and the lymph glands in the immediate neighbourhood are greatly enlarged. There may be no generalised infection where this method of inoculation is practised, death being due to toxic poisoning. This method of inoculation requires a somewhat longer period to result fatally, usually being from twenty-five to thirty-eight days.

Rabbits. Rabbits inoculated intra-peritoneally, present lesions very similar to those seen in guinea-pigs. There is a generalised actinobacillosis, in which the thoracic and abdominal viscera are involved to a greater or less extent. There is usually ulceration of the intestinal tract, more particularly of the cæcum and large intestine. In one instance this was very extensive. The serous membranes of the thoracic abdominal cavity are extensively involved. The pericardial membrane contains nodules. Inoculated intra-peritoneally with either pure cultures or pus, rabbits die from it in from fifty-one to seventy days. In one instance one hundred cubic centimetres of fluid was contained in the abdominal cavity, and in this fluid the characteristic tuft formation was demonstrated on microscopic examination.

We have not studied the virulence of this germ for other animals at this laboratory.

Microscopic examination. The microscopic examination of the pus and tissues from animals affected with Actinobacillosis requires special technique to differentiate their various characteristics. The best results are obtained by the use of eosin and methylene blue, and the method described by Lignières and Spitz has given excellent results with both the smear preparations from pus and paraffin sections of affected tissue. The methods of Gram and Wiegert also give good microscopic preparations. A saturated solution of eosin may be used, followed by Unna's alkaline methylene blue. Good microscopic preparations of the pus may be obtained by the use of Romanowsky's stain as modified by Dutton and Todd. (Liverpool School of Tropical Medicine, 1902).

Sol. A. Medical methylene blue (Hoechst)	grms.	·5
Saturated sol. of chemically pure borax	c.c.	0·5
Incub. 4 days at 37° C. then add abs. alcohol	c.c.	50·0
Sol. B. Eosin, Extra B.A. crystals (Hoechst)	grms.	25·0
Distilled water	c.c.	50·0
Absolute alcohol	c.c.	50·0

For use dilute with water, one part of stain to nineteen parts of water. Mix equal parts of diluted stain in a flask and pour immediately into a staining dish. Stain three to six minutes. Wash quickly but thoroughly in tap water and dry in the air without the aid of heat.

In fresh pus the tufts are not easily distinguished, but when squeezed between the slide and coverglass are clearly visible, even to the naked eye. They are of a whitish-grey colour, and may be more easily examined if a little picro-carmine glycerine is placed at the edge of the coverslip, as the tufts stain yellow with picric-acid and the rest of the field will assume a reddish tinge.

Lesions in the various organs and tissues exhibit the same general characters as are exhibited by the tufts in the pus. The peculiar bulb-like processes are seen to extend toward the surrounding tissue, similarly as is the case in actinomycosis. Immediately surrounding the mass of the lesion is an inflammatory area, its extent depending upon the nature of the lesion.

Actinobacillosis is an infectious disease, capable of communication by direct inoculation. We are not prepared at the present time to indicate the degree of danger through co-habitation, but from the nature of infective agent we believe that this danger is perhaps slightly greater than is the case with actinomycosis. We have not found in any of the material indication of grains.

Treatment. We have conducted no experiments with this end in view, but we have the results of other workers, who indicate treatment consisting prin-

cipally in the administration of large doses of potassium-iodide. This treatment, while beneficial, will have no ultimate results unless prescribed early in the manifestation of the affection, from the fact that in the majority of cases the lesions are located in the region of the larynx, and from the extensive tumour formation respiration is seriously interfered with. If the disease process has extended too far the condition of the animal is such as to make treatment an unprofitable investment, for we have beside the actual lesions, the toxin poisoning to deal with.

THE POSOLOGY OF ANTITOXINS.

The following notes, from the pages of *The Medical Officer*, directly apply to the treatment of Diphtheria in the human subject, but much of the information is applicable in other directions, and the whole question has interest for many of our practitioners. They have interest, too, in showing that even in the States, where sentiment plays a large part, the beneficent results gained by the use of vivisection are not only retained but enforced by State legislation.

THE ADMINISTRATION OF DIPHTHERIA ANTITOXIN FOR CURATIVE PURPOSES, by WILLIAM H. PARK, M.D., Director, Research Laboratories, New York City Department of Health.

The amount of toxin present in any case of diphtheria is comparative small. Probably 100 units of antitoxin would be sufficient to neutralise the amount of toxin in the most severe and malignant cases ever met with. If we gave antitoxin, as many suppose, simply in sufficient amounts to neutralise the poison which we believed to be present, doses would be limited to from 50 to 100 units. As a fact, we give many multiples of this because only a little of the antitoxin injected is quickly brought into direct contact with the toxin. It must first enter the blood stream and then, very gradually, and in small amount, pass through the capillary walls and so at last come in contact with the toxin in the tissues. The larger the concentration of antitoxin in the blood the more rapid will be its passage from the vessels to the tissues. The combined endeavour of the clinical observer and the laboratory worker is to find the suitable amount and the method of injection which will cause a sufficient concentration of antitoxin to be absorbed into the blood from any given dose at any period of time. We can also determine the amount which passes out to the tissue fluids. The clinical observer on his side can note the changes which take place as he watches the progress of cases after different methods of antitoxin treatment.

It is only recently that the great importance of the method of administering the antitoxin has been appreciated. When given subcutaneously, the swelling caused by its injection rapidly disappears, but the antitoxin remains behind in the tissues and is only gradually absorbed in the blood. By testing many patients, it has been found that it takes in some cases a day for even the major part of the antitoxin to be absorbed by the blood from the tissues. The greatest accumulation of antitoxin in the blood is on the third day after a subcutaneous injection. Through the use of the Schick test, it has been determined that an injection of antitoxin given intravenously passes out to the tissues about ten times as rapidly as when the dose is given subcutaneously and subsequently absorbed. Intramuscular injections are more rapidly absorbed than subcutaneous. A unit thus gives most effect when given intravenously and least when given subcutaneously.

Another matter which is of importance is the size of the individual treated. It is self-evident that, if a child weighing twenty pounds is injected with 10,000 units, it would, on the average, have in its blood five times as much antitoxin per cubic centimetre as a person who weighs 100 pounds and receives the same amount. The influence of weight on the dose is, however, largely neutralised by the fact that diphtheria in the child is generally more dangerous than in the adult. Every minute of delay in the neutralisation of the toxin in a severe case is of importance, but in a mild case there is time and it makes less difference. Infants and children are especially liable to laryngeal diphtheria, so that every case in a child presents a certain gravity which in the adult may not be present.

The last point to be considered is as to whether a single or a multiple dose should be given. It must be realised that antitoxin has no effect whatever on injury which has already taken place. If the toxin is firmly united with the cell substance, antitoxin is no longer of any service. It is the early and sufficient dose which is important. When we give a divided dose, we get the effect of the first portion only, during the interval before the giving of the second dose. If the first dose was insufficient, we lose the effect of the part reserved for the second dose. When the first dose has been of a sufficient size, the second and third injections, though harmless, are absolutely useless. The holding back of a part of the first dose so as to give it later, simply delays its action to a time when it cannot have much, if any, effect.

For the last three years we have used at the Willard Parker Hospital, and for shorter periods in other places, only a single dose of antitoxin, which, in mild cases, has been given subcutaneously; in moderate cases, subcutaneously or intramuscularly; and in very severe cases, intravenously or intravenously and intramuscularly.

The intravenous injection of antitoxin should not be undertaken by the inexperienced.

Dr. Hermann M. Biggs, Health Commissioner for the State of New York, has been pointing out that the use of antitoxin has reduced the diphtheria death-rate in New York State from 99 per 100,000 in 1894 to 20 per 100,000 in 1914. In pre-antitoxin days one person in every three who caught diphtheria died of it. To-day, of cases which receive antitoxin after the fourth day of the disease about one in twelve is fatal, against one in fifty in cases treated with antitoxin on the first or second day.

EVOLUTIONARY ETIOLOGICAL FACTORS IN DISEASE.

The following, which occurs in the Correspondence columns of *The Lancet*, enunciates a view which has been held for years past by some of us. The modification of B. Anthracis by environment has been known to some veterinary pathologists for years past. One attractive hypothesis in connection is that B. Tuberculosus is originally a vegetable parasite, and takes on its pathogenicity only by passage through the bodies of herbivora—mainly bovines, but extending even to the caprine species.

I can at once enunciate my view by stating that I *do* attack the thesis that a bacterium of pathogenic properties is of so constant and specific a character that it is not subject to the forces of evolution or retrogression. Indeed, within a comparatively short time, from the human point of view, such an organism under unusual environment may become innocuous or its pathogenicity may be altered so that it becomes an essential factor in the causation of some other infective process, whether labelled or not by some other specific name of disease. It is, I submit, unthinkable that a special germ has been created for each form of infectious disease. Surely

pathogenic bacteria must have evolved from saprophytes.

How far down the scale of evolution of organic life from (pristine incandescent) inorganic matter bacteria came into existence who can tell? Charlton Bastian's experiments appear to indicate that they are among primeval forms of life. In any case they are, perhaps, the most primitive forms of life known to us, and then only recognisable as "individuals" through the aid of powerful magnification.

Germ plasm and soma plasm are apparently undifferentiated in bacteria, and their vegetative multiplication is staggering in its intensity up to uncountable numbers, the multiplication of individual bacteria in favourable environment being equivalent in the course of an astronomical day of 24 hours to the multiplication of at least 50 generations of men. In other words, a day in the life of the bacillus in favourable circumstances is as a thousand years in the history of man. On further consideration from an evolutionary point of view, it is really equivalent to a much greater epoch of time, since the germ plasm of the bacillus is fully exposed to environmental influences, and is thus, in a far greater degree than animal tissues, capable of evolving and transmitting inborn traits from acquired variations. It has been experimentally proved that the anthrax bacillus (which is as specific a bacillus as can be named) can be so altered by environment in a few days that it loses its power of spore formation, and its pathogenicity is considerably modified by simply incubating a culture of the bacillus at 42° C. Dr. Roux, director of the Pasteur Institute, reported in April, 1914, that Madame Victor Henri succeeded in his laboratory in converting anthrax bacilli into new microbes as different from normal anthrax microbes as the latter are from diphtheria bacilli, and capable of communicating a *new* disease to guinea-pigs. This change was effected by subjecting cultures of anthrax bacilli to the prolonged action of ultra-violet rays.

I wonder whether his very extensive clinical experience has ever led ——— to conceive as a possibility that there may be a subtle relationship between diphtheria and scarlet fever which could be explained on the supposition that the diphtheria bacillus and the still uncertain organism, which specifists would claim as the scarlet fever germ, might be decendants from a common ancestral organism. The frequency with which so-called Hoffmann's bacillus is found in swabbings from the throats of both scarlet fever patients and of diphtheria patients is certainly suggestive from the bacteriological point of view. Outside hospital practice one meets with very puzzling forms of mild infective disease which may be looked upon as "sports," and which are probably due as much to retrogression as to true evolution in the causal germ responsible, or in the reactive phenomena of the body tissues. How it is possible to regard the numerous strains of bacilli coli, together with Gaertner's bacillus, the typhoid bacillus, the paratyphoid bacillus, *et hoc genus omne*, as separate creations. There is no difficulty in understanding them as evolved from a common ancestral organism.

Nosology is convenient, but not always strictly accurate. Disease is recognised by the reactive phenomena of the body invaded by pathogenic germs. (The symptoms may be caused by the coincident stimulation of more than one variety of germ). Erysipelas is generally the result of body reactions against a streptococcus, which some think they can differentiate as a specific streptococcus, but even in so recent a publication as *The Lancet* of August 7th, Professor F. C. Madden, of Cairo, relates a case of spreading cellulitis where "we were hardly prepared to find that the culture [from the pus] showed an almost pure growth of staphylococcus aureus."

I have already trespassed on your space. Further reasons from a bacteriological point of view may be found, if desired, in my little book on "Evolution and Disease," which will be amplified should it reach a second edition. Suffice it to say, that in my view when once a saprophyte has evolved into a pathogenic bacterium its perpetuation as a disease producer of constant character, such as, say, typical scarlet fever or typical diphtheria, depends chiefly on the constancy of the environmental conditions. Our knowledge even of the best-known pathogenic bacteria, such as the diphtheria bacillus with its already extensive literature, is by no exhaustive. The key to a more comprehensive knowledge of its origin will be found in a clearer appreciation of evolutionary etiological factors in disease.

Norwich, Aug. 28. J. T. C. NASH,
County Medical Officer for Norfolk

ANTHRAX CONVEYED BY INFECTED SHAVING BRUSHES

By REGINALD R. ELWORTHY, M.D. LOND., M.R.C.P. LOND., D.P.H. CAMB., Pathologist of the West London Hospital. [Abridged].

The patient was 32 years of age. June 29th: In the evening he noticed what he considered to be a boil coming on the front of his neck. 30th: He woke up to find considerable swelling of his neck. His medical attendant noted a high temperature and much œdema of the neck, but no "pustule" formation. July 1st: He was admitted to the West London Hospital.

There was a small yellow patch of subcuticular necrosis over the most prominent part of his thyroid cartilage in the middle line, with about half a dozen vesicles lying on its margin, and extensive œdema limited above by the lower jaw, spreading over the clavicle, and fading gradually towards the middle line behind. The mass was tender on manipulation and non-crepitant. Temperature, 99° F.; pulse-rate, 120.

After a general anæsthetic at 7 p.m., the patient became conscious but remained profoundly collapsed throughout the night, sweating profusely and becoming gradually more cyanosed. The temperature was subnormal, and the pulse-rate 150 and over. Death occurred at 7.30 a.m. on July 2nd, the total duration of illness being 60 hours. No bacteriological examination was made during life.

At the post-mortem examination held six and a half hours later it was seen that the œdema had made considerable headway, extending from the lower face above to the xiphisternal notch below.

Positive cultures possessing the cultural and biological characteristics of B. anthracis were obtained from the spleen, lungs, liver, stomach, and upper intestine, and œdema fluid from the neck, mediastinum, and pleura, but not from the bronchial mucus. There was no urine to examine. Control anaerobic cultures from the neck, blood, and spleen showed no bacterial growth. It was concluded that the bacillus had entered the blood stream through the skin of the neck, as no appearance of a primary lesion in the intestines or the lungs could be discovered.

Clinically this was an example of so-called "erysipiloid" anthrax, which is characterised by the insignificance or deferred appearance of "pustule" formation, rapidly spreading œdema, and a high mortality. It is usually seen in the neck or eyelids where the tissue is loose and cellular. The œdematous infiltration may be marked without death ensuing. There is an example recorded in the Annual Report of the Chief Inspector of Factories for 1908, in which a flesher, who had extensive œdema of the face, upper extremities, trunk, and right thigh, recovered after the use of 90 c.c. of Sclavo's serum in 20 c.c. doses.

An early diagnosis was rendered difficult partly on account of the type assumed by a disease which is rarely

ACTINOBACILLOSIS OF THE TONGUE.

FIG. 1.

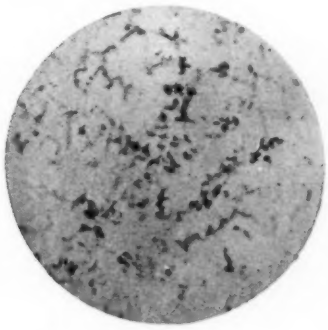

FIG. 2.

Fig. 1. A tuft from fresh pus of case 1. Coverslip preparation stained by the method of Lignières and Spitz. Highly magnified (x 1500 diameters).

Fig. 2. Bacilli of Actinobacillosis. Coverslip preparation from a culture on whole egg media. Stained with carbol-fuchsin Highly magnified (x 1000 diameters).

FIG. 1

FIG. 2

Fig. 1. Section from the tumour mass of case I., cut in paraffin, and stained by the method of Lignières and Spitz. Highly magnified (x 1000 diameters).

Fig. 2. Section of tumour from case IV. Section cut in gum on a freezing microtome. Stained by the method of Gram, but not fully discoloured. Highly magnified (x 1000 diameters).

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UMI

seen in most London hospitals, but chiefly because the man's occupation was one of the last to suggest anthrax. The odds were as much against his having cellulitis of the neck due to B. anthracis as they would have been in favour of this had he been a brushmaker or hide salter.

The point of immediate interest was in what manner infection came about. With this object in view, and bearing in mind the protean nature of anthrax purveyance, some of the patient's relatives were rigorously questioned, but with so little success at first that it seemed that this case would have to be relegated to the unsatisfactory group of unproven etiology, were it not for an observation made at the post-mortem examination. At that examination it was noted that the small local lesion came well within this individual's shaving area, which covered a larger ground than usual. This suggested the idea that a new shaving brush might have laid a charge which the subsequent passage of a razor exploded. The relatives of the patient were therefore asked to follow up this clue, with the result that another member of the family, the actual purchaser and donor of the shaving brush, stated that her son had certainly used the brush she had bought during the fortnight it had been in his possession, but only a few times, as he had not altogether discarded his old one.

At the subsequent inquest a verdict was brought in that death was due to anthracæmia, possibly contracted from shaving with an infected brush. At this inquiry expert veterinary opinion was opposed to this provisional suggestion. It was held that vegetable fibre rather than animal was usually employed in the making of these cheaper brushes, and that infection from them was therefore improbable. But the three facts—viz., the site of the lesion, the use of a new shaving brush, and the absence of any other discoverable source of infection, together with the one possibility, viz., the fibre used in that new brush might be of animal origin and infected—were sufficient to suggest a working hypothesis which later investigation proved conclusively.

Fortunately the brush had not been washed after the last time of shaving. It was of poor quality (wholesale price 6d.). The fibre used was animal with a small leaven of vegetable. The former moiety appeared to be made up of hair of various kinds, some being artificially dyed to resemble badger. After comparison with known samples, it was concluded that pig bristles, horse hair, and possibly cow tail were present. The main point, however, was that animal hair was present in abundance.

As regards the examination of the hair, it was thought that if a wash made from all of them was inoculated into an animal death might ensue from some infection that would mask anthrax. It was also thought that the infection might be limited to one variety of hair in particular. Therefore, about a third of the fibre was removed from the handle. This freed portion, after a prolonged scrutiny, was divided up according to the varieties of hair it was thought were present—*i.e.*, from pig, horse, or cow—were separated into groups, and the unrecognised remainder treated as a separate batch. These hairs, as arranged, were then examined (*a*) singly by heating in broth at 90° C. for 30 seconds and laying in parallel rows on surface agar, and (*b*) in groups by washing in broth and plating the centrifuged deposit after heating. These preliminary experiments were fruitless.

Later the rest of the brush was "lathered" in a stone mortar in imitation of the ordinary process occurring in shaving with 20 to 25 c.c. of sterile broth rendered definitely alkaline to phenol-phthalein with 5 per cent. sodium hydrate. The collected washings, after heating at 80° C. for 15 minutes, were divided into three portions. One of these was stored for further work if necessary. The second was centrifuged and the deposit collected in 1 c.c. of the supernatant broth. This was thoroughly shaken and distributed in decreasing amounts through three agar plates. Among the many colonies which occurred on these plates three proved to be B. anthracis on subculture and inoculation. The deposit from the remaining third was injected into a young rabbit weighing 1000 grammes. This animals died three days later from typical anthrax: the organism grown from the animal's blood was subcultured and inoculated into a guinea-pig with similar results.

Five unused brushes, together with the one bought and used by the patient comprised a lot of six from the same manufacturer exposed for sale in a druggist's shop. They were dealt with in the same way, i.e., by "lathering" in alkaline broth. The washings were invariably very dirty. Great care was exercised in rinsing and sterilising each mortar before treating another brush, as it was thought that otherwise infection might easily be carried through a series of brushes.

Brushes.	Result of inoculation into guinea-pig.
Original	B. anthracis.
No. 2	Negative.
„ 3	B. anthracis; also B. perfringens.
„ 4	B. anthracis; also B. malignant œdema.
„ 5	B. anthracis.
„ 6	B. anthracis.
„ 1A	B. anthracis; also B. perfringens.
„ 2A	B. anthracis.
„ 3A	B. anthracis; also B. perfringens.

The foregoing list of results obtained from the examination of two batches of brushes—the first six being those obtained from the druggist's shop—shows the widespread distribution of the spores and how gross the infection was on certain of the brushes.

The animals inoculated survived periods varying from 30 hours to 5 days. Those that died soon—viz., those inoculated from brushes 3 and 4, and 1A and 3A—did not show the characteristic post-mortem appearances of anthrax, but there was no difficulty in obtaining the bacillus by culture from the blood and spleen.

The following observation, though very insufficiently worked out, may be mentioned as throwing perhaps a little light on hair infection. About 30 pediculi found in a guinea-pig dead from anthrax were planted out on to the surface of agar plates, without any preliminary heating to destroy other organisms. Two gave rise to colonies of anthrax, which appeared first about the anal regions of the pediculi. (Of these two colonies, one was confirmed by inoculation and the other identified by culture only).

OBITUARY

ROY HERBERT CHARLES LUCAS, Lt. A.V.C. (attd. R.F.A.)
Graduated, Lond.: Dec. 22, 1914.

Lieut. Lucas died on Christmas Day, in his billet in France, in his sleep, owing to an escape of gas. He leaves a young widow.

W. J. WILLIAMS, M.R.C.V.S., Abergavenny.
Graduated, Lond.: March, 1881.

Mr. Williams died on December 3rd, aged 57.

Anglo-Franco-Belgian Veterinary Relief Fund.

The following additional donation is reported:—

Mr. R. A. Thrale, Croydon	£1	1	0
Previously reported	80	6	0
Total	£81	7	0

DISEASES OF ANIMALS ACTS 1894 TO 1914, SUMMARY OF RETURNS.

Period.		Anthrax		Foot-and-Mouth Disease.		Glanders† (including Farcy)		Parasitic Mange.		Sheep Scab.	Swine Fever.	
		Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Out-breaks	Out-breaks.	Slaughtered.*
IRELAND. Week ended Dec. 26		...	...	...	...	...	...	Outbreaks 1		3	3	10
Corresponding Week in	1914 ...	...	...	...	...	...	...	...		6	1	1
	1913 ...	...	...	...	...	...	...	...		22	...	...
	1912 ...	...	...	...	...	...	...	...		3	...	16
Total for 52 weeks, 1915 ..		2	2	...	...	1	3	72		412	247	13 61
Corresponding period in	1914 ...	1	1	76	957	...	...	76		484	193	967
	1913 ...	...	...	...	...	1	1	113		557	133	893
	1912 ...	3	3	68	382	...	...	66		373	212	1706

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Dec. 27, 1915

NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

ARMY VETERINARY SERVICE

WAR OFFICE, LONDON, S.W.

Extract from *London Gazette*,

WAR OFFICE, WHITEHALL, Dec. 30.

REGULAR FORCES. ARMY VETERINARY CORPS.

Temp. Lieut. to be temp. Capt.:—A. E. D. Froggatt (Dec. 17).

To be temp. Lieuts.:—T. I. Alexander (Dec. 15); R. Hopps (Dec. 17).

Jan. 1.

To be temp. Lieut:—F. R. Staples (Dec. 15).

Jan. 3.

Temp. Lieut. to be temp. Capt.:—T. W. W. Hindle (Dec. 21).

To be temp. Lieut.:—J. Connor (Dec. 20).

Jan. 5.

Temp. Lieut. W. J. S. Foley relinquishes his commn. (Dec. 23).

TERRITORIAL FORCE. ARMY VETERINARY CORPS.

Jan. 1.

To be Lieut.:—J. Baxter (Jan. 2).

Jan. 3.

Lieut. J. Crooks resigns commission (Jan. 4).

To be Lieut.:—W. W. Scales (Jan. 4).

Jan. 5.

To be Lieut.:—N. A. McG. MacEwan (Jan. 6).

MENTIONED IN DESPATCHES.

REGULAR FORCE.

Gen. Sir J. D. P. French, Field-Marshal Commanding-in-Chief the British Army in France, in a despatch dated Nov. 30, mentions the following "names of those whom I recommend for gallant and distinguished service in the field":—

Col. (temp. Brig.-Gen.) J. Moore, C.B., F.R.C.V.S.; Maj. H. E. Gibbs; Maj. (temp. Lt.-Col.) R. H. Holmes, F.R.C.V.S.; Maj. H. Kirby; Maj. J. A. B. McGowan; Maj. K. McL. McKenzie; Maj. H. S. Mosley; Maj. J. S. Nimmo; Maj. A. Olver, F.R.C.V.S.; Maj. F. C. O'Rorke, F.R.C.V.S.; Maj. E. J. Wadley; temp. Maj. A. S. Head, F.R.C.V.S. (Capt., Res. of Off.); Capt. E. Hearne; Capt. (temp. Maj.) A. B. Mattinson, F.R.C.V.S. (S.R.); temp. Capt. C. W. Makinson; Lt. J. G. T. Edwards (S.R.); temp. Capt. W. B. De Vine; temp. Qmr. and hon. Lt. J. Fisher; temp. Qmr. and hon. Lt. J. F. Ives: temp. Qmr. and hon. Lt. W. H. Mawdsley.

Sgt.-Maj. F. H. Young, 91; Farr. Staff-Sgt. R. Woolley, 177; Staff-Sgt. C. H. Barrow, SR/32 (S.R.); Staff-Sgt. H. Carrigan, 303; Staff-Sgt. G. Langley, 579; Staff-Sergt. J. G. Robertson, 447; Staff-Sgt. R. W. Vane, 516; Staff-Sgt. P. J. Wellings, SR/31 (S.R.); Sgt. C. V. D. Hay, SE/7805; Sgt. W. Knowler, SE/886; Sgt. F. Nelson, SE/8060; Sgt. C. Roberts, 444.

TERRITORIAL FORCE.

Maj. E. M. Perry, F.R.C.V.S.; Capt. (temp. Maj.) J. Abson, F.R.C.V.S.; Capt. C. Hartley, F.R.C.V.S.; Lt. T. Bagshaw; Sgt. D. B. Douglas, 3, Northumbn. Div.; Cpl. F. Lucas, SM/83, S. Mid. Div.; Lce-Cpl. C. Taylor, SM/56, S. Mid. Div.; Shg.-Smith A. Webb, 10, S. Mid. Div.

CANADIAN A.V.C.

Capt. T. C. Evans; Sgt. O. C. White, 48506.

INDIAN A.V.C.

Sgt.-Maj. R. Ford, 7265.

The following casualties in the Expeditionary Force are reported:—

DIED—Pte. W. G. Standen, SE/6904.
Lieut. R. H. C. Lucas, attached R.F.A.

The following casualty in the Mediterranean Expeditionary Force is reported:—

DIED—Pte. W. Davey, 4204, Australian A.V.C.

The A.V.C. Comforts Fund.

Dear Sir,—I have pleasure in again sending you lists of subscriptions received and contributions of woollen comforts, as kindly sent me for our A.V.C. men on active service. Also I enclose some extracts from letters from Officers of Veterinary Hospitals and mobile sections showing their appreciation of gifts which have been supplied from this Fund. It will be most gratifying to those who have contributed so generously to know that the comforts are so much appreciated.

May I take this opportunity to ask all those who are interested in the Fund to forward to me with as little delay as possible any gifts either of money or comforts, as I am now despatching large consignments, in response to lists sent me, of things urgently required, and I am anxious not to deplete the amount in credit to the Fund to too great an extent—I feel that we must keep a small reserve for any future contingencies which may arise.

I hope all those kind friends who have supported my efforts so heartily will accept again my thanks for their help.—Yours truly,

ADELAIDE M. MOORE.

Strathyre, Parsifal Road,
Hampstead, N.W.

List of Contributions received to Jan. 5th :—

	£	s.	d.
Mr. R. C. Trigger	1	1	0
Mr. George Bushman, Islington	1	1	0
Lieut.-Col. G. A. Oliver (per Lieut.-Col. Stratton, Edinburgh)	2	0	0
Mrs. Bainbridge (per Mrs. Moscrop)		10	0
Per Mrs. Fowler, Bedford	1	0	0
W. V. Allan, Esq., Windsor	1	1	0
W. Jackson Young, Esq., Edinburgh	1	0	0
Mrs. Hodgkins		10	0
Capt. Routledge (per Col. Rutherford)	13	1	0
per Dr. Bradley (the Manager and staff Distillers Co., Ltd., S. Queensferry)	2	0	0
Dr. Bradley, Edinburgh (Special Entertainment)	10	0	0
Capt. F. B. Sneyd, A.V.C.	1	0	0
Lieut. R. F. Wall, A.V.C., T., per Mr. H. A. MacCormack	5	0	0
Mrs. Lenox Conyngham		10	0
Major Edmund J. Lawson, Dublin	1	1	0
per Mr. George Howlett		10	6
From No. 6 Vet. Hos., Whist Drive, Sergeants' Mess	1	10	6
per Mrs. Bolton, Miss Edwards, Neath		10	6
	£43	6	6

Mrs. Barber (Brewood): Mufflers, helmets, mittens, socks

per Mrs. Shipley (Gt. Yarmouth):—
Miss P. S. Shipley: Mittens. Miss E. L. Shipley: Socks. Mrs. Wilkinson: Socks, mittens. Miss Harrison: Socks. Mrs. Ward: Socks. Mrs. Pyman: Socks.

per Mrs. Bolton (from Mrs. Callingham): Mufflers, mittens, helmets.

Mrs. Howard (Balham): Mufflers.

Mrs. Welborn: Socks.

Mrs. Sargent (Bexhill): Mufflers, socks.

Miss Fairholme: Gloves. Mrs. Kay Lees: Socks.

Mrs. Pounceby: Muffler.

Mrs. Fearnside: Socks, mittens.

Mrs. Bennett: Mufflers.

Mr. Fred Bullock (Highbury): Mittens, socks.

Miss Hinxman: Mufflers, belts, cuffs, mittens.

Mrs. Barcham (Norwich): Mufflers, mittens.

Miss Record (Blackheath): Mufflers, socks.

Mrs. O'Rorke: Gloves, mittens.

Mrs. Mosley: Scarves, helmets, socks, gloves, mittens.

Mrs. Quinlan: Shirts.

Mrs. Leckie: Shirts, socks, helmets, mittens, scarves.

Mrs. W. C. Barling (Gloucester): Shirts.

Mrs. Manuel: Mufflers, mittens.

Mrs. Garnett: Mufflers, helmets, cuffs, socks, mittens.

Miss Harper: Shirts, cardigan, mufflers, socks, books.

Mrs. Fearnside: 6 parcels, each containing 1 pr. mittens, tobacco, cigarettes, chocolates, boot laces, papers and socks.

Mrs. Walker: Gloves, helmets.

Mrs. Pounceby and Mrs. Charlton: Mufflers, mittens.

per Dr. Charnock Bradley (Edinburgh): Socks, mufflers, mittens.

The Misses Campey: Mufflers, mittens, books, magazines.

Mrs. Swan: Socks.

per Mrs. Shipley: Mittens, mufflers, helmet, socks.
Miss Bartlett: Body belts, socks.
Mrs. Thurston (sen.): Mittens, mufflers.
Mrs. Johnson: Socks.
Miss P. Shipley: Mittens, cuffs.

Miss M. Moore, Miss Clogg: Mufflers.

Mrs. E. H. Scott: Socks, mittens.

Miss MacGregor: Mufflers, socks, mittens.

Mrs. Barber (Brewood): Mufflers, helmets, mittens.

Mrs. Hodgson: Mufflers.

Miss Edwards: Mufflers, mittens.

Mrs. Temple: Scarves, helmets.

Mrs. Nuthall: Mittens, socks, mufflers.

Mrs. Crafer: Scarves.

Mrs. Frank Thornton: Helmets, scarves, handkerchiefs, mittens, cuffs, mufflers.

Mr. F. W. Cox (Derby): Cuffs, mufflers, socks.

per Miss Queripel (from Mr. J. H. Bennett, Romford), and per Mr. P. Perkins (Hastings), parcel of warm clothing.

Miss C. Harper and Mr. Chas. Morgan: Shirts, cardigan, mufflers, socks, scrap book and book.

Mrs. Bernard Blomfield and Miss Vincent: Pants, cardigans, sweaters, mufflers, mittens.

Mrs. Crawford and Mrs. Callingham: Helmets.

per Mrs. Garnett (from Mrs. Bowlan): Socks, mittens, mufflers, magazines.

Mrs. Pritchard: Mufflers, helmets, socks, mittens.

Mrs. Charlton and Miss Joyce: Mittens.

Mrs. Walsh: Mrs. Howard: Mufflers.

Mrs. Hamilton: Mufflers, socks, mittens.

Mrs. Shipley: Mittens, helmets.

Miss Bevis: Mufflers, belts, mittens, handkerchiefs.

Mrs. Dunlop Martin: Shirts, helmets, mufflers, mittens.

Mr. D. W. Hewson: Socks, magazines, box of shaving and toilet necessaries.

Mrs. Porteous: Tobacco, cigarettes, books.

Mrs. Haywood: Mufflers, helmets, gloves, mittens.

Anon.: Mittens and socks.

Mrs. Burke Savage: Socks. Mrs. Rutherford: Socks.

Mrs. Moscrop: Socks, mufflers, mittens.

Mr. Chas. Sheather: Socks, scarves.

Mrs. J. Willett: Helmets, cigarettes.

Dr. Charnock Bradley: Socks, mufflers, mittens, helmets.

Mrs. Bennett: Mufflers. Mrs. Latta: Socks.

Mrs. Barford: Mufflers.

Mrs. Pounceby: Mufflers, mittens.

The men had a splendid day and greatly appreciated this kind gift from the A.V.C. Comforts Fund. Many of the men said they never had such a dinner and good time before.

I am enclosing a postal order for 30/-, the result of a sale by auction of the "Booby Prize" at a whist drive given in our Sergeants' Mess at Christmas. It is their wish that this amount should be given to the Comforts Fund.

Please accept my sincere thanks on behalf of the men.

With best wishes for 1916.—Yours faithfully,

H. THIRBY.

No. 6 Veterinary Hospital,
Rouen, 1st Jan., 1916.

I am writing to thank you very much for the excellent Christmas cake sent to me by the Fund. I have been asked to thank you on behalf of the N.C.O.'s for this very acceptable gift. They all enjoyed it very much indeed.

We all had a very happy Christmas in spite of the mud and weather conditions generally.

We all send you our best wishes for the New Year to you and all the workers for the Fund.—Yours sincerely,

H. E. IRWIN.

No. 6 Mobile Veterinary Section,
6th Division, Jan. 1.

I was away on leave over Christmas, at my home, and when I got back I got your lovely cake and card wishing

us all good luck. I had all the other five V.O. to tea on New Year day, when we had your cake, and we all thank you and the A.V.C. Comforts Fund, for so kindly remembering us.—Yours respectfully,

J. F. PLAYER, Lt. A.V.C.
37 Mobile Vet. Sec., 25th Division.

New Year's Day.

On behalf of the Section I have to thank you for your good wishes and for the splendid cake which we received a few days ago. It was decided that the cake should be kept for tea to-day, and it has been very much appreciated.

The men have had very good cheer, and have spent as happy a Christmas as was possible under the circumstances.

With every good wish for the New Year. Yours truly,

E. E. JELBART, Capt. A.V.C.,
30th Mobile Vet. Sec.

Jan. 2nd, 1916.

I beg to present my compliments, and on behalf of my Section to offer you our sincere thanks in appreciation of your kindness in sending us the beautiful cake, which we all enjoyed thoroughly. It was not quite in time for Xmas but we had it for New Year's Day. We all extend to you and our kind friends who have done so much for us our heartiest New Year greetings; and we all hope that by this time next year this horrible war will be over, so that we may all get home to our friends again. Most sincerely yours,

ANDREW R. B. RICHMOND, Lt. A.V.C.
O.C. No. 3 Mobile Vet. Sec.

The Cumberland Pig.

As the outcome of preliminary meetings held in various centres, the project to establish a Herd Book for the Cumberland breed of pigs was successfully floated at a well-attended meeting of breeders held at Wigton (Cumberland) on Tuesday. Mr. W. Parkin-Moore, Mealsgate, president of the Shorthorn Society of Great Britain, presided, but Mr. T. B. Schofield, live stock officer, Newcastle-on-Tyne, who is an active mover in the project, was unable to be present.

Mr. J. Steel, V.S., Wigton, acted as hon. secretary, *pro. tem.*, and read a report from Mr. Schofield upon the present position. So far, nineteen gentlemen had intimated their willingness to become life-members, at a subscription of £5. One gentleman was subscribing £20, so that they had in hand or promised at present the sum of £110, together with the promise of several days' free motoring for the Inspection Committee. A large number of people had written to him intimating their willingness to become annual members. Others apparently preferred to wait until the project was further advanced before making up their minds. He had applications for membership from Scotland, and it would appear probable that they should receive support from a wide district.

The Chairman: They would see that there had been enough support to justify them in going on with the scheme, so the discussion could be kept to the best way of forming the society and the preliminary arrangements.

Mr. J. Hope, Leegate House, raised the question of the disqualification for the Herd Book of pigs with dark spots.

The Chairman said they had exactly the same difficulties in breeding cattle. They had black noses they did not want in cattle, which prevented their registration. Every pig society had the same difficulty. A very good suggestion had been made—that the Cumberland pigs should be white, and that any with black marks or black hair should be disqualified, but that blue spots as long as the hair was white, whilst being an objection, should not be an absolute disqualification.

In reply to a question:—As far as they could see, the annual subscription should be 10s. 6d., with an entrance fee of 10s. 6d., and that life-members be taken up to the end of that meeting at £5. After that there would probably be no life members allowed.

After discussion, it was agreed that the Council, for first year only, consist of the life members.

The Council were empowered to proceed with the drawing up of the articles of association, rules and bye-laws, etc., and generally to take steps to place the society on a sound footing, also to advertise for and appoint a Secretary and other paid officers necessary for carrying on the work of the society.

DISEASES OF ANIMALS ACTS 1894 TO 1914, SUMMARY OF RETURNS.

Period.		Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange. ‡		Sheep Scab.	Swine Fever.	
		Out-breaks (a)	Animals.	Out-breaks (a)	Animals.	Out-breaks (b)	Animals.	Out-breaks (b)	Animals.	(b)	Out-breaks (a)	Slaughtered. *
GT. BRITAIN. Week ended Jan. 1		15	15			2	8	80	171	33	90	220
Corresponding week in	1915 ...	21	21							18	97	461
	1914 ...	20	20			3	18	61	134	9	48	290
	1913 ...	11	14			5	15	90	206	15	25	651

‡ The Parasitic Mange Order of 1911 was suspended from 6th August, 1914, to 27th March, 1915, inclusive.

(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked:—
Board of Agriculture and Fisheries, Jan. 4, 1916 Cambridge 3, Stafford 5.

IRELAND. Week ended Jan. 1		2	6	...	...	...	...	Outbreaks 3		13	1	...
Corresponding Week in	1915 ...	...	...	...	...	...	...	...		10	3	5
	1914 ...	...	...	...	...	...	...	2		12	1	...
	1913 ...	...	...	...	...	...	...	9		21	...	35

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Jan. 3, 1916
NOTE.—The figures for the Current Year are approximate only. * As diseased or Exposed to Infection.